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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/843,545	04/26/2001	Richard D. Harris	01AB021	9246

7590 10/15/2003

John J Horn
Rockwell Technologies, LLC
1201 S Second Street, 8-T29
Milwaukee, WI 53204

EXAMINER

CULBERT, ROBERTS P

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/843,545	HARRIS ET AL.	
	Examiner	Art Unit	
	Roberts Culbert	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-27 and 35-56 is/are allowed.
- 6) ☒ Claim(s) 1,28-34 and 57 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>0803</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Response to Arguments

Applicant's arguments filed 9/15/03 with respect to claim 57 have been fully considered but they are not persuasive.

Applicant has argued that Itoigawa fails to teach releasing a movable MEMS element as recited in step (e) of pending claim 57.

The argument is not persuasive because Itoigawa clearly does show the claimed step as described in the previous office action. See figure 9F and Figure 8 (finished product) and the related discussion.

Applicant's arguments with respect to claims 1, and 28-34 have been fully considered but they are not persuasive.

Applicant has argued that Christenson fails to teach or suggest all elements recited in claim 1, and that no teaching within Christenson suggests creating the recess in the second, rather than the first, substrate. However, the teaching, suggestion or motivation to modify the prior art to produce the claimed invention may be found either explicitly or implicitly in the prior art references themselves or in the knowledge generally available to one of ordinary skill in the art. See MPEP 2143.01

Applicant has argued that Christenson teaches away from creating the recess in the second substrate, as recess 52 is deeper than the entire thickness of substrate 58 as illustrated in Figs. 4H-4M. The argument is not persuasive because the drawings are clearly not to scale as would be recognized by one of ordinary skill in the art.

Claim Rejections - 35 USC § 112

Applicant's amendment to the claims, filed 9/15/03, is sufficient to overcome the rejections under 35 U.S.C. 112 second paragraph.

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Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 57 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,946,549 to Itoigawa.

Referring to figures 9A-9F and the finished device in figure 8, Itoigawa teaches a method for fabricating a MEMS device on a substrate having a movable MEMS element portion free from the substrate and disposed adjacent a stationary MEMS element that is in mechanical communication with the substrate comprising: providing a silicon layer with opposed first and second surfaces (25), depositing a spacer material (24) onto the first surface of the silicon layer (25), forming a recess in the spacer material (figure 9B) attaching the spacer material to the substrate (22) to form a composite structure having a void disposed therein (figure 9C), and removing a portion of the silicon layer to expose the void and release the movable MEMS element. Compare figure 9F and the finished product figure 8.

Although Itoigawa teaches that the wafer (32) constitutes layers (31), (24), and (25), the combination of layers (31) and (25) also constitute a wafer as defined in the prior art, (i.e. an epitaxial layer wafer), therefore the claimed invention does not define over Itoigawa as broadly recited.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1, and 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,428,713 to Christenson.

Referring to figures 4A-4M, Christenson teaches a method for fabricating a MEMS device on a substrate having a movable MEMS element portion free from the substrate and disposed adjacent a stationary MEMS element that is in mechanical communication with the substrate comprising: providing a wafer (58) having first and second surfaces, providing a silicon substrate (50) with first and second surfaces, forming a recess into the first surface of the substrate (figure 4B) to produce a spacer member disposed at the periphery of the recess, mechanically connecting the spacer member to the wafer to form a composite structure having a void (52) disposed therein (figure 4G), and removing a portion of the wafer to expose the void and to release the movable MEMS element from the stationary MEMS element (figure 4M).

Christenson does not teach forming a recess into the first surface of the wafer to produce the spacer member.

However, one of ordinary skill in the art would have recognized at the time of invention that the spacer member may alternatively be made by forming a recess into either the wafer or the substrate and thus the spacer member may be formed from either the substrate or the wafer material. One of ordinary skill in the art would have been motivated to form the recess into the wafer instead of into the substrate in order to eliminate the step of etching into the substrate material. This design choice would enable all of

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the etching steps including the release of the movable MEMS element to be performed with the same etching process (i.e. liquid or gas phase, chemistry selection, process conditions).

Regarding claims 28 and 29, Christenson teaches the formation of a stationary MEMS element that has electrically isolated first and second conductive elements (60) See figure 4M. Christenson also shows a movable MEMS element having at least two electrically isolated conductive elements (18). See the top view of the structure shown in figure 1.

Regarding claims 30-34, Christenson teaches that the substrate is made primarily of silicon, or may be made from ceramic, sapphire or stainless steel (Col. 8, Lines 35-43).

Allowable Subject Matter

Claims 2-27, and 35-56 are allowed.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (703) 305-7965. The examiner can normally be reached on Monday-Friday (7:30-4:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

R. Culbert



GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700